

Circulating calprotectin in rheumatic diseases

Calprotectin is an acute-phase protein (heterodimer of S100A8 and S100A9) highly expressed by monocytes and neutrophils. During inflammation, neutrophils migrate to the inflammatory site and secrete large amounts of calprotectin acting as a soluble proinflammatory mediator. Locally released calprotectin enters the systemic circulation where it can be measured in serum and plasma, directly reflecting joint inflammatory activity.¹⁻³

The value of calprotectin in chronic inflammatory conditions

Calprotectin in serum and plasma has been described as valuable biomarker in several chronic inflammatory conditions, including multiple rheumatic conditions. It has been reported to correlate with and partly outperform clinical disease activity scores, ultrasound and other inflammatory biomarkers. Calprotectin's bio-marker potential is reported in diagnosis and differentiation, prediction of treatment response and flares, as well as treatment monitoring.¹⁻⁴ Therefore, incorporating calprotectin testing into clinical practice could significantly enhance the management of these diseases, by allowing for early detection of disease activity, more accurate evaluation of treatment response, and timely identification of disease relapse.



Disease activity and relapse in rheumatoid arthritis (RA)

Since the concentration of circulating calprotectin reflects the degree of inflammation in rheumatoid arthritis (RA), it can provide valuable assessment of disease activity, treatment response and relapse. Calprotectin has been proven to be a very sensitive biomarker, allowing detection of even low disease activity distinguishing it from remission.^{5,6} This is in contrast to C-reactive protein (CRP) and erythrocyte sedimentation rate (ESR), which are low in 40% of patients despite active disease.⁵⁻⁷ Moreover, RA patients are often treated with a wide range of medications, some of which indirectly lower downstream levels of CRP. Calprotectin can therefore be a useful biomarker when CRP is normal or difficult to interpret, such as in patients treated with therapies that suppress interleukin-6 (IL-6) or tumor necrosis factor (TNF).⁸⁻¹¹ In addition to direct treatment monitoring, calprotectin can also independently predict disease relapse guiding patient monitoring and treatment decisions.¹²

Guidance of treatment in JIA and Still's disease

In care for Juvenile Idiopathic Arthritis (JIA) patients, calprotectin has proven great value in prediction of remission, flares and treatment response. Before treatment, high levels of calprotectin can indicate a positive treatment response¹³⁻¹⁵, whereas low calprotectin levels can guide safe withdrawal of treatment.¹⁵⁻¹⁷ Additionally, during monitoring of patients in remission, calprotectin can provide an early indication of relapse.¹⁸

In the case of the systemic autoinflammatory diseases, sJIA and Adult onset Still's disease (AOSD), calprotectin has been described in diagnosis, predicting relapse, and evaluating disease activity.¹⁹ Especially the differentiation of sJIA and AOSD with other inflammatory conditions is challenging, where calprotectin allows the critical early differentiation. Furthermore, calprotectin levels can be used as a predictive biomarker for relapse and correlate with treatment response guiding disease management.²⁰⁻²²



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GCAL[®] on clinical chemistry systems – TAT 10 min

Gentian's calprotectin immunoassay GCAL[®] is the first turbidimetric assay for the quantitative measurement of calprotectin in plasma and serum intended as an aid in the detection and assessment of inflammation.

The assay can be applied on a wide range of automated clinical chemistry analysers. GCAL[®] is CE-marked and IVDR certified. It is not cleared for use in the USA (Research Use Only).*

Immunoassay performance

Gentian Calprotectin Immunoassay Performance	
Sample type	Li-Heparin plasma, Serum
Assay type	PETIA
Format	Liquid reagents, ready to use
Precision (sample >1 mg/L) ¹	Total CV < 4.0 %
LoQ ¹	0.3 mg/L
Security zone ¹	Up to 95 mg/L
Measuring range ¹	0.4 - 20 mg/L
Calibration stability ¹	4 weeks

¹Instrument dependent results achieved on Architect c4000 during validation

Product range

Product no.	Product	Content
1201	Gentian GCAL [®] Calprotectin Reagent Kit	R1 54 mL + R2 9 mL
1202	Gentian GCAL [®] Calprotectin Reagent Kit S	R1 30 mL + R2 5 mL
1219	Gentian GCAL [®] Calprotectin Control Kit	2 x 1 mL
1251	Gentian GCAL [®] Calprotectin Calibrator Kit	6 x 1 mL



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